IN THE CLAIMS

1. (Currently amended) A method for scheduling arriving data packets for input to a switch having a plurality of input ~~channels;~~ channels and a plurality of output channels, ~~said scheduling being performed in successive scheduling phases where each scheduling phase further comprises at least log N scheduling iterations,~~ the method comprising the steps of:

~~prior to a first scheduling iteration of each scheduling phase:~~

receiving at ~~each~~ one or more of said plurality of input ~~channels~~ channels, one or more data packets destined for transmission to one of said plurality of output channels ~~and~~ wherein each of said plurality of input and output channels are classified as unmatched prior to ~~said~~ a first scheduling iteration; and

storing said one or more received data packets into at least one data scheduling envelope associated with each of said ~~plurality of~~ one or more input channels ~~channels, said at least one data scheduling envelope being configured to store a plurality of data packets~~;

~~in each of said at least log N scheduling iterations of said each scheduling phase:~~

~~(a)~~ assigning a channel pair weight to unmatched input-unmatched output channel pairs having ~~a~~ at least one data scheduling envelope storing ~~at least one~~ one or more data packets, ~~packet destined for transmission~~ wherein the channel pair weight is computed such that it depends on a delay value of a first received data packet in the associated at least one data scheduling envelope;

~~(b)~~ sending a match request from each unmatched input channel to an unmatched output channel having a highest channel pair weight ~~there-between~~ therebetween; and

~~(c)~~ accepting a match request at each unmatched output channel from an unmatched input channel whose assigned channel pair weight ~~there-between~~ therebetween is determined to be highest from among all received match requests.

2. (Currently amended) The method of claim 1 wherein the step of assigning a channel pair weight to unmatched input-unmatched output channel pairs further includes the steps of:

for each unmatched input-output channel pair:

determining a number of bytes to be transmitted ~~there-between~~ therebetween;

determining a delay value associated with a received data packet having a highest

time-stamp to be transmitted ~~there-between~~ therebetween; and

computing an assigned channel pair weight as a linear combination of said determined number of bytes and said determined delay.

3. (Currently amended) A method for scheduling arriving data packets for input to a switch having a plurality of input channels, i=1...N, and a plurality of output channels, j=1..N, ~~said scheduling being performed in successive scheduling phases where each scheduling phase further comprises at least log N scheduling iterations,~~ each of said plurality of input channels being further comprised of N virtual output queues, VOQs (i,j), for buffering at least one data packet P(i,j) received on the ~~Ith~~ ith input channel destined for the ~~Jth~~ jth output channel, the method comprising the steps of:

~~in each scheduling phase:~~

receiving said at least one data packet, P(i,j), received at said ~~Ith~~ ith input channel destined for said jth output channel;

storing said at least one received data packet, P(i,j), in an ith channel data scheduling envelope associated with a virtual output queue VOQ(i,j), wherein a first scheduling envelope at said VOQ(i,j) is a head-of-line data scheduling envelope and a first stored data packet in said head-of-line data scheduling envelope is a head-of-line packet;

~~in each of said at least log N scheduling iterations of each scheduling phase:~~

~~(a)~~ assigning a weight, w_{ij}, to each non-empty head-of-line scheduling envelope for each unmatched input channel ~~unmatched in a previous log N scheduling iteration~~ wherein the weight is computed such that it depends on a delay value of a head-of-line packet;

~~(b)~~ sending a match request from each unmatched input channel to an unmatched output channel whose assigned weight w_{ij} ~~there-between~~ therebetween is highest;

~~(c)~~ determining at each of said unmatched output channels a highest assigned weight w_{ij} from among all received input channel match requests; and

~~(d)~~ granting at each of said unmatched output channels a match request to an input channel whose determined assigned weight w_{ij} ~~there-between~~ therebetween is highest.

4. (Currently amended) The method of claim 3 wherein the step of assigning a weight to each

non-empty virtual output queue VOQ(i,j) for each unmatched ith input channel ~~not matched in a previous scheduling iteration~~ further comprises the step of computing said assigned weight as:

$$w_{ij} = [\log_2 (q_{ij}) + 1] - K$$

where q_{ij} is the number of bytes arriving at an input channel from among said plurality of input channels destined for output channel from among said plurality of output ~~channels ,~~ channels, and K is the logarithm of the number of bytes in a smallest received packet.

5. (Currently amended) The method of claim 3 wherein the step of assigning a weight to each non-empty virtual output queue VOQ(i,j) for each unmatched ~~Ith~~ ith input channel ~~not matched in a previous scheduling iteration~~ further comprises the steps of:

determining a delay d_{ij} as a number of said at least log N scheduling iterations which have passed, as measured from a point at which a head-of-line (HOL) data packet is received in a HOL envelope at said non-empty virtual output queue VOQ(i,j);

assigning a maximum weight $w_{ij}(max)$ to said virtual output queue VOQ(i,j) if said delay d_{ij} exceeds a predetermined threshold; and

otherwise computing said assigned weight as:

$$w_{ij} = [\log_2 (q_{ij}) + 1] - K$$

where q_{ij} is the number of bytes arriving at input channel destined for output channel, and K is the logarithm of the number of bytes in a smallest received packet.

6. (Currently amended) The method of claim 3 wherein the step of assigning a weight to each non-empty virtual output queue VOQ(i,j) for each unmatched ~~Ith~~ ith input channel ~~not matched in a previous scheduling iteration~~ further comprises the step of computing said assigned weight as:

$$w_{ij} = [\log_2(d_{ij})] + K'$$

where d_{ij} is the delay of a head-of-line (HOL) data packet in a HOL envelope at VOQ(i,j), and ~~$K' = [\log_2[E]] - K$~~ $K' = [\log_2[E]] - K$

where

E is the number of bytes per envelope, and

K is the logarithm of the number of bytes in a smallest received packet.

7. (Currently amended) The method of claim 3 wherein the step of assigning a weight to each non-empty virtual output queue VOQ(i,j) for each unmatched ~~Ith~~ ith input channel ~~not matched in a previous scheduling iteration~~ further comprises the step of computing said assigned weight as:

$$w_{ij} = [\log_2(d_{ij})] + [\log_2(e_{ij}) - K]$$

where

e_{ij} is the number of bytes in a head-of-line (HOL) envelope;

d_{ij} is the delay of a HOL data packet in a HOL envelope at VOQ(i,j); and

K is the logarithm of the number of bytes in a smallest received packet.

8. (Currently amended) Apparatus for scheduling arriving data packets for input to a switch having a plurality of input channels and output channels, each of said plurality of input channels being further comprised of J virtual output queues, VOQs (i,j), for buffering said data packets received on the ~~Ith~~ ith input channel destined for the jth output channel, DP(i,j), the apparatus comprising:

means, associated with each input channel, for storing the data packets, DP(i,j), arriving at the associated input channel in at least one scheduling envelope residing at an associated VOQ(i,j);

means, associated with each input channel, for assigning a weight, W_{ij}, to each VOQ(i,j) having at least one non-empty scheduling envelope wherein the weight is computed such that it depends on a delay value of a first received data packet in the associated at least one data scheduling envelope;

means, associated with each input channel, having at least one VOQ(i,j) having an assigned weight, W_{ij}, for sending a request to the jth output having the highest assigned weight W_{ij}; and

means, associated with each output channel J, for granting a request from an output channel J, responsive to said received input channel requests, to an input channel I having the highest assigned weight, W_{ij}.

9. (Original) The apparatus of claim 8, further including:

means, associated with each output channel, for matching an input-output channel pair wherein the input-output channel pair has the highest assigned weight, W_{ij}, therebetween.

10. (Original) The apparatus of claim 8, wherein the means for assigning a weight to each VOQ(i,j) further includes,

means, associated with each VOQ(i,j), for determining a total number of bytes comprising said stored data packets arriving at the associated VOQ(i,j); and

means, associated with each VOQ(i,j), for determining a delay associated with a head-of-line packet.

11. (Currently amended) A switching apparatus for distributing data packets input from each of a plurality of input ports to a plurality of output ports, said switching apparatus comprising:

a comparator connected to simultaneously receive weight elements in successive clock cycle iterations, wherein the weight elements are computed such that they depend on a delay value of a first received data packet, said comparator configured to output a largest weight element from among the received weight elements in each clock cycle iteration;

a demultiplexer configured to receive said largest weight element from said comparator, said demultiplexer further configured to distribute said largest weight elements to output lines; and

a plurality of comparators each configured to receive the largest weight elements from a corresponding output line of said output lines, each of said plurality of output comparators being further configured to output a largest weight element from among said received weight elements.

12. (Currently amended) A switching apparatus for distributing data packets input from each of a plurality of input ports to a plurality of output ports, said switching apparatus comprising:

means for simultaneously receiving weight elements in successive clock cycle iterations wherein the weight elements are computed such that they depends on a delay value of a first received data packet;

means for outputting a largest weight element from among the received weight elements in each clock cycle iteration;

means for distributing said largest weight element from said outputting means; and

output selection means for selecting the overall largest weight element from among a plurality of largest weight elements received from said distributing means.

13. (New) The method of claim 1, wherein the steps of assigning a channel pair weight, sending a match request, and accepting a match request are performed in successive scheduling phases.

14. (New) The method of claim 13, wherein each scheduling phase comprises at least log N scheduling iterations.

15. (New) The method of claim 3, wherein the steps of assigning a weight, sending a match request, determining a highest assigned weight, and granting a match request are performed in successive scheduling phases.

16. (New) The method of claim 15, wherein each scheduling phase comprises at least log N scheduling iterations.